Electronic Supplementary Information

Diverse binding of important anions in 1-D tricopper coordination polymer (ACP) architectures

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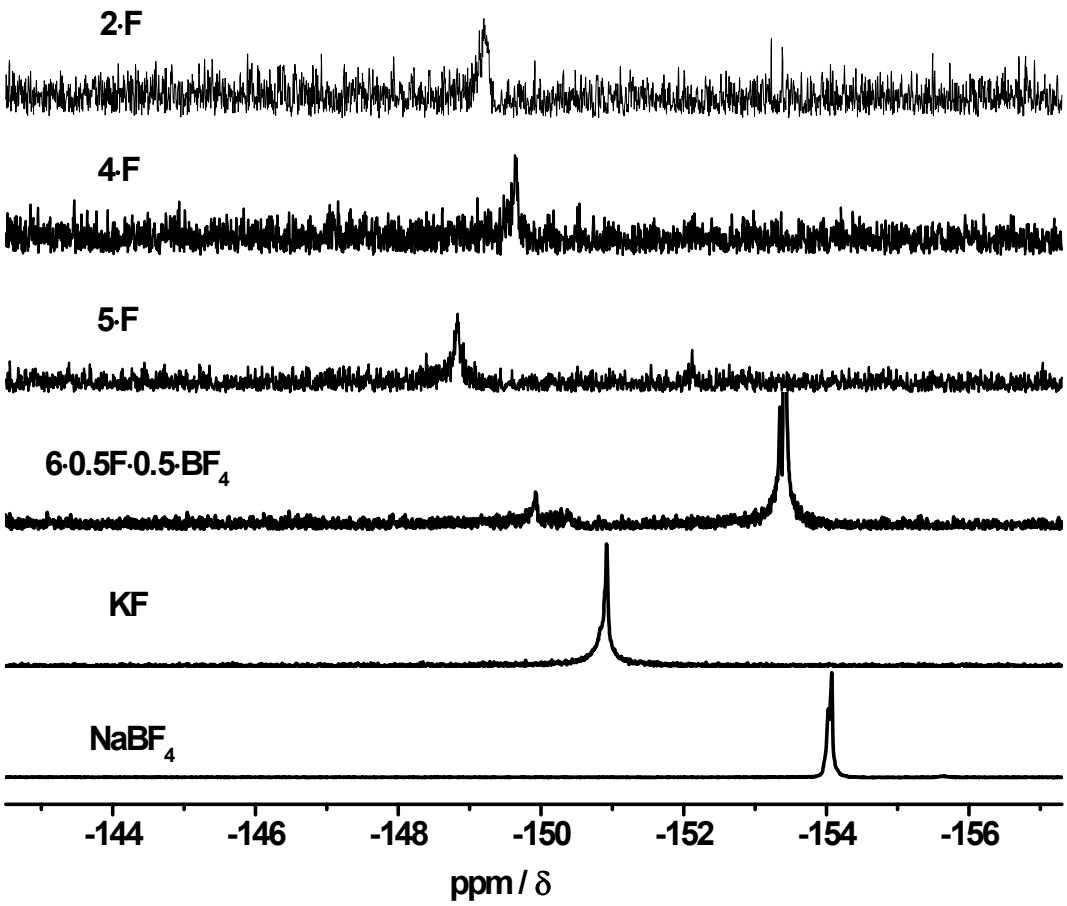


Figure S1. ^{19}F NMR (228 MHz, acetone–d_6/methanol–d_4 (v/v = 1), 298 K) spectra of **2·F**, **4·F**, **5·F**, **6·0.5F·0.5BF$_4$**, KF, and $NaBF_4$.

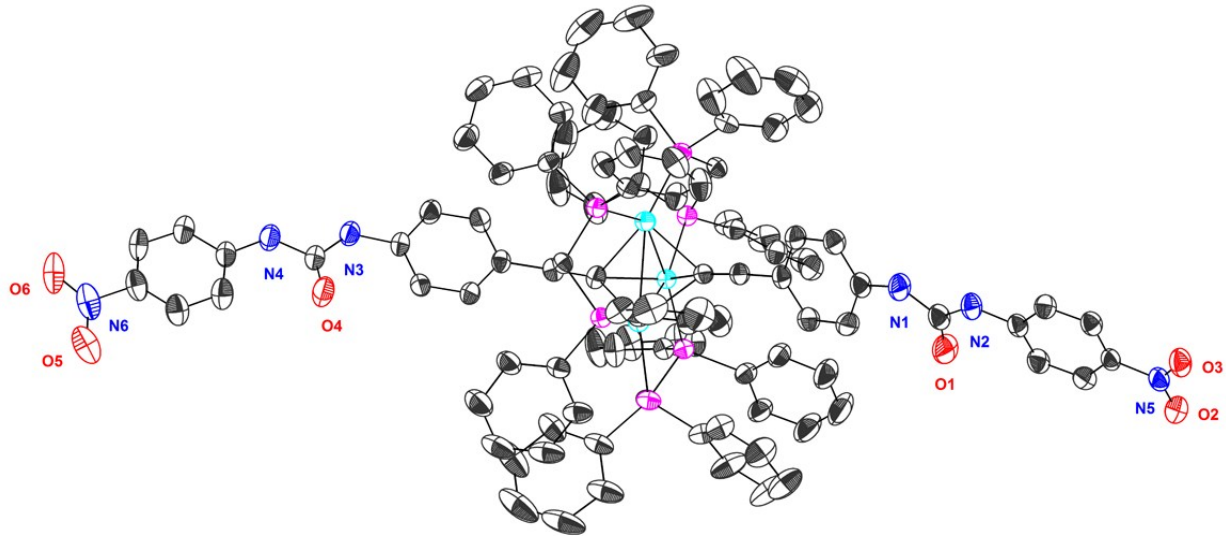


Figure S2. Perspective view of cation **1** in **1·F** with the atomic numbering scheme (hydrogen atoms are omitted for clarity). Thermal ellipsoids are shown at 30 % probability level.

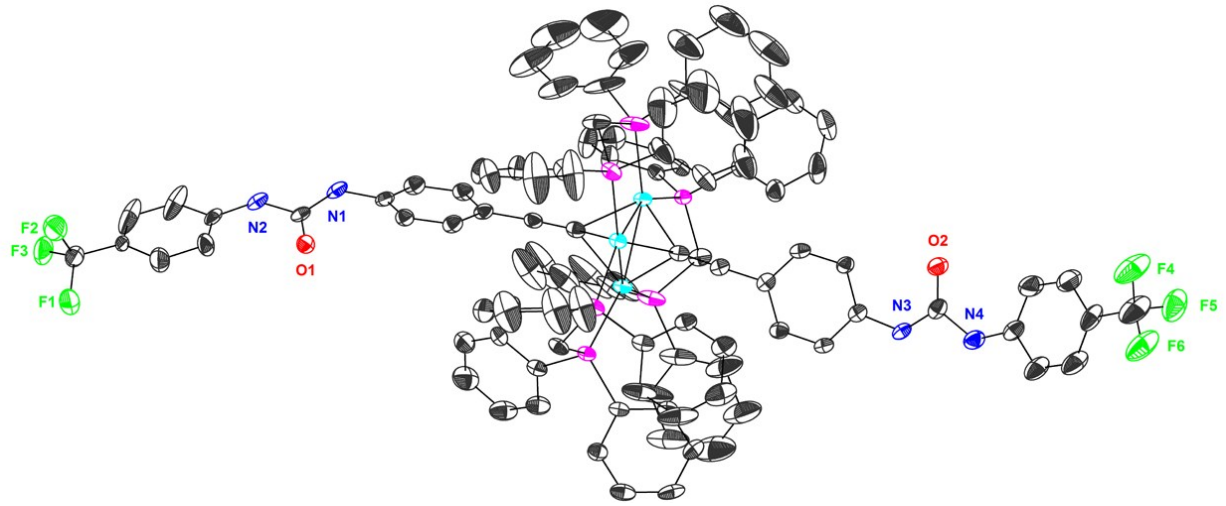


Figure S3. Perspective view of cation **2** in **2·F** with the atomic numbering scheme (hydrogen atoms are omitted for clarity). Thermal ellipsoids are shown at 30 % probability level.

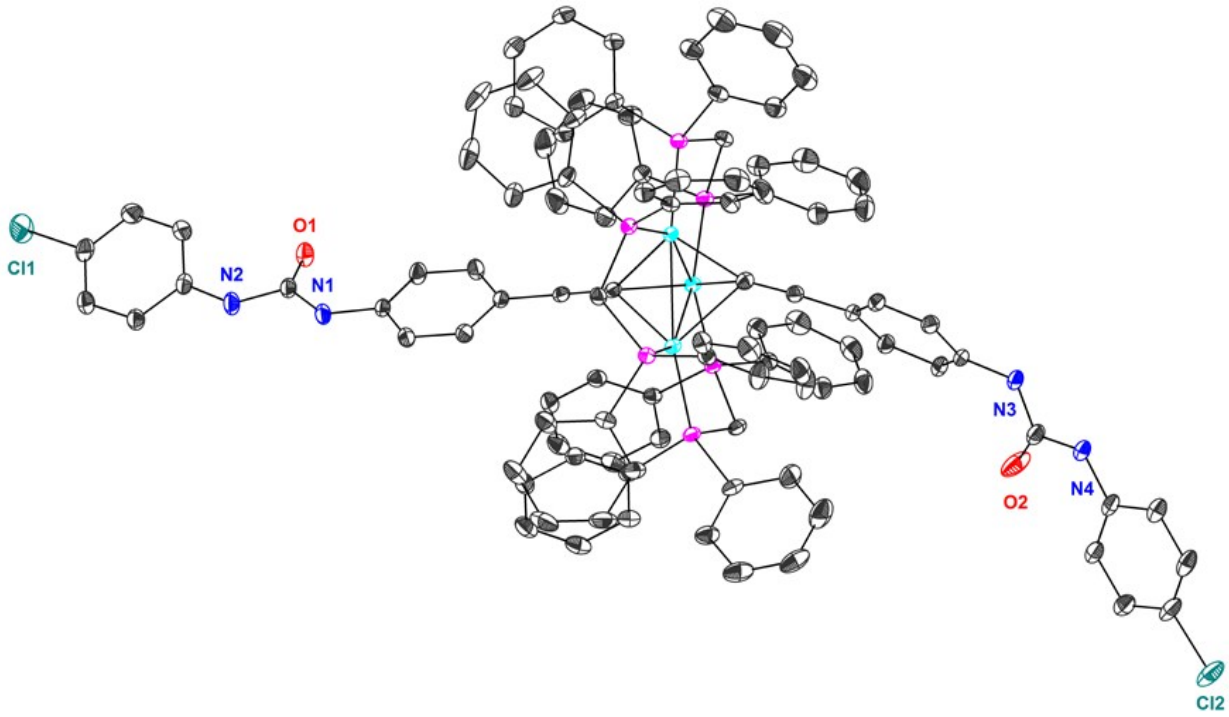


Figure S4. Perspective view of cation **3** in **3·BF$_4$** with the atomic numbering scheme (hydrogen atoms are omitted for clarity). Thermal ellipsoids are shown at 30 % probability level.

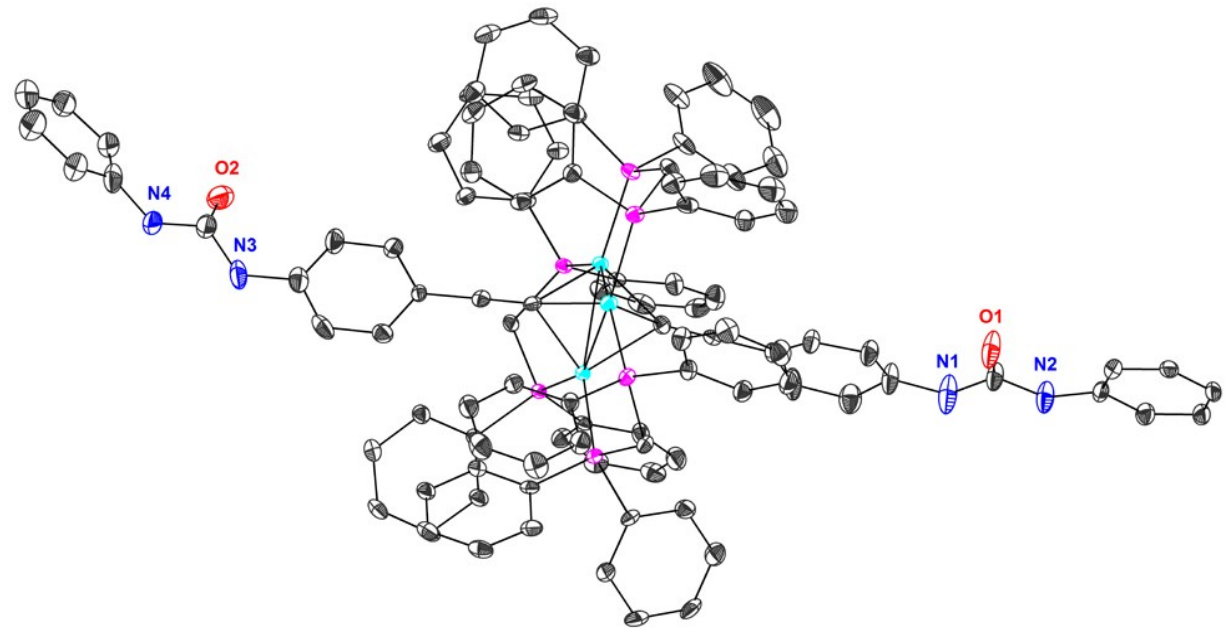


Figure S5. Perspective view of cation **4** in **4·F** with the atomic numbering scheme (hydrogen atoms are omitted for clarity). Thermal ellipsoids are shown at 30 % probability level.

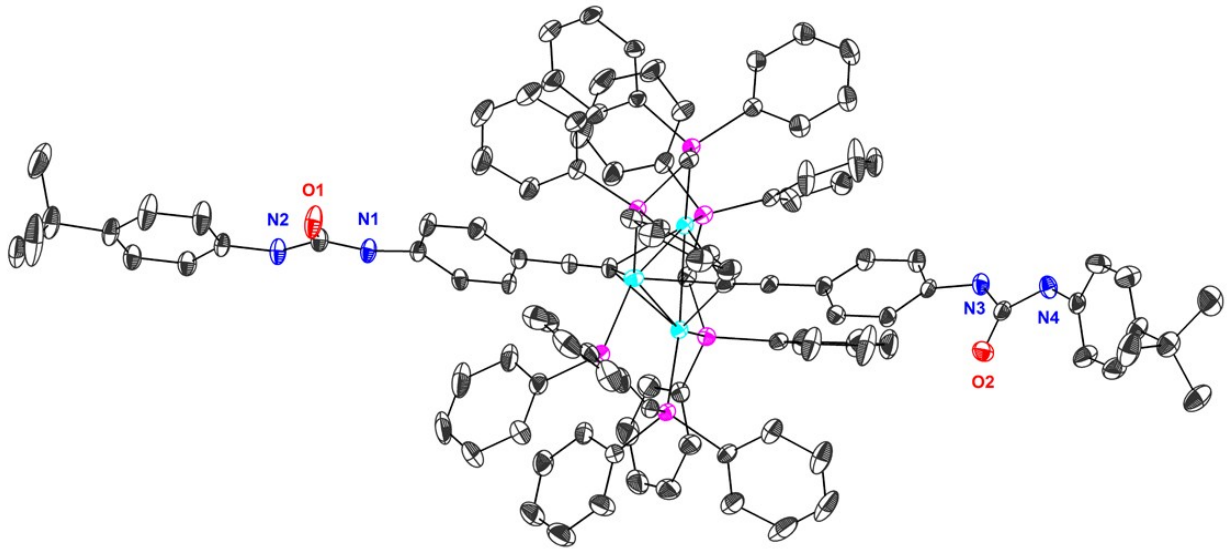


Figure S6. Perspective view of cation **5** in **5·BF$_4$** with the atomic numbering scheme (hydrogen atoms are omitted for clarity). Thermal ellipsoids are shown at 30 % probability level.

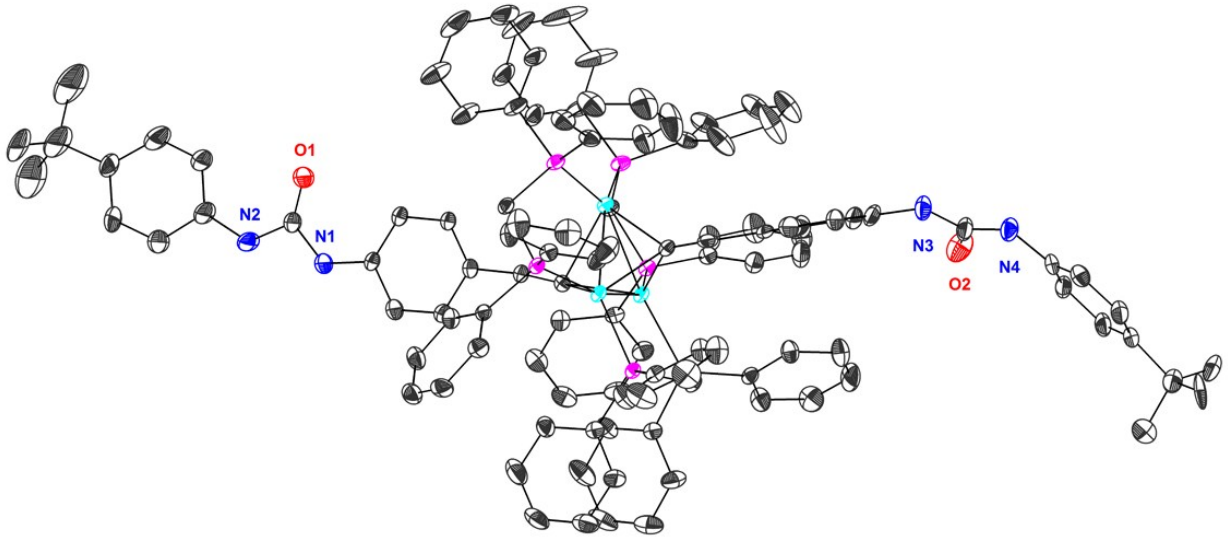


Figure S7. Perspective view of cation **5** in **5·F** with the atomic numbering scheme (hydrogen atoms are omitted for clarity). Thermal ellipsoids are shown at 30 % probability level.

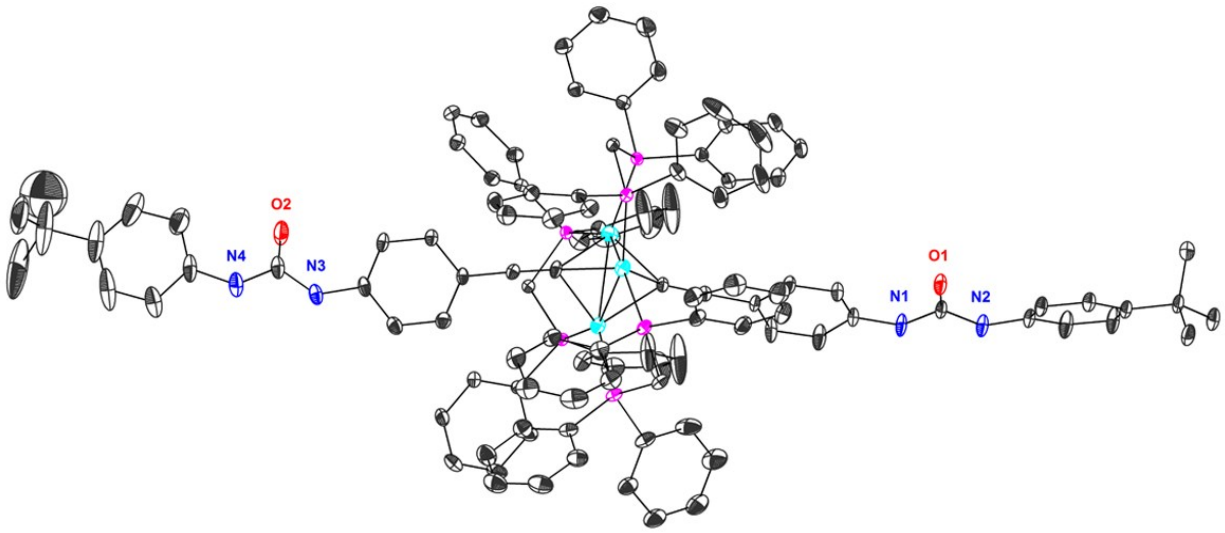


Figure S8. Perspective view of cation **5** in **5·NO$_3$** with the atomic numbering scheme (hydrogen atoms are omitted for clarity). Thermal ellipsoids are shown at 30 % probability level.

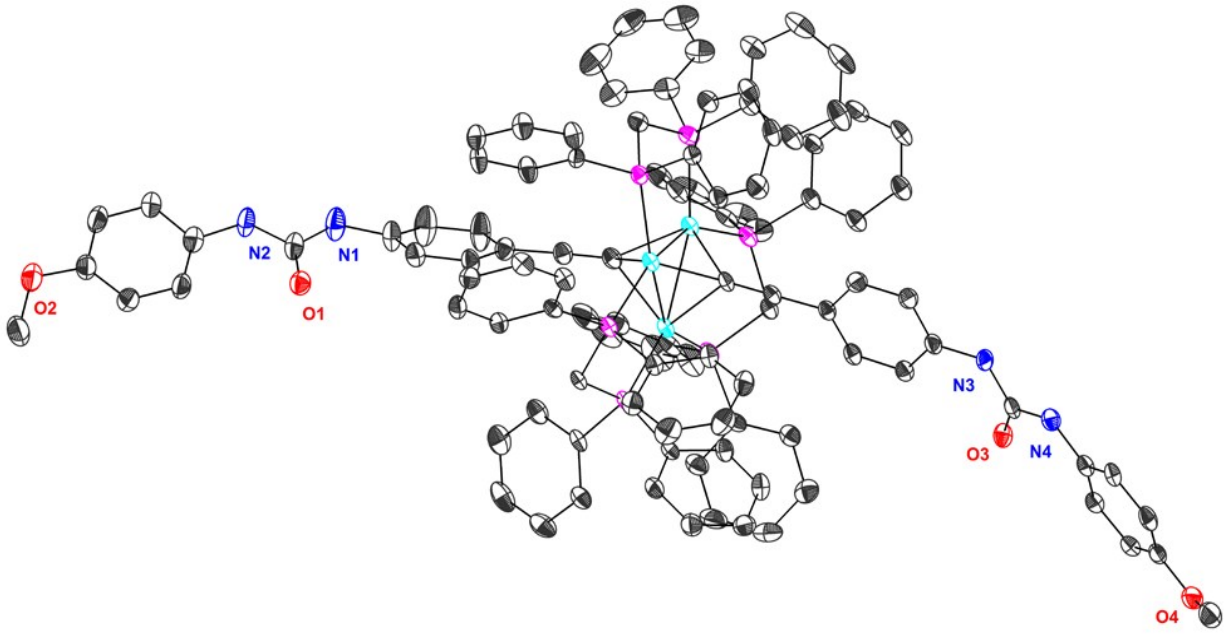


Figure S9. Perspective view of cation **6** in **6·0.5F·0.5BF$_4$** with the atomic numbering scheme (hydrogen atoms are omitted for clarity). Thermal ellipsoids are shown at 30 % probability level.

Table S1. Crystallographic data for **3·BF_4**, **4·F**, **5·F,** and **5·NO_3**.

	3·BF_4	**4·F**	**5·F**	**5·NO_3**
Formula	$C_{113}H_{106}BCl_2Cu_3F_4N_4O_4P_6$	$C_{109}H_{98}Cu_3FN_4O_3P_6$	$C_{113}H_{104}Cu_3FN_4O_2P_6$	$C_{113}H_{104}Cu_3N_5O_5P_6$
M (g/mol)	2118.16	1907.35	1945.44	1988.45
Crystal system	Triclinic	Monoclinic	Monoclinic	Orthorhombic
Space group	*P*-1	*P*2/*c*	*P*21/*m*	*Pcca*
a(Å)	13.946(3)	19.431(4)	14.710(3)	27.9483(3)
b (Å)	14.296(3)	20.455(4)	21.288(4)	21.5782(2)
c (Å)	26.749(5)	25.426(5)	19.399(4)	36.4721(4)
α (°)	81.29(3)	90	90	90
β (°)	77.99(3)	91.90(3)	110.49(3)	90
γ (°)	81.78(3)	90	90	90
Volume ($Å^3$)	5121.6(19)	10100(4)	5691(2)	21995.4(4)
Z	2	4	2	8
D_c(g/cm^3)	1.374	1.254	1.135	1.201
Reflections collected	42615	47089	35347	54383
Independent reflections	21781	19542	11308	19210
R_{int}	0.0218	0.0451	0.0291	0.0290
R,[a] R_w[b] [$I>2\sigma(I)$]	0.0386, 0.1029	0.0519, 0.1371	0.0649, 0.2050	0.0464, 0.1171
Goodness-of-fit	1.014	1.050	1.208	1.036

[a] $R = \Sigma(|F_0|-|F_c|)/\Sigma|F_0|$ [b] $R_w = [\Sigma w(|F_0|-|F_c|)^2/\Sigma w(|F_0|)^2]^{1/2}$

Table S2. Selected bond lengths (Å) and angles (°) for **1·F** and **2·F**

1·F		**2·F**	
Cu(1)···Cu(2)	2.5679(9)	Cu(1)···Cu(2)	2.6127(9)
Cu(1)···Cu(3)	2.5870(7)	Cu(1)···Cu(3)	2.6160(9)
Cu(2)···Cu(3)	2.7552(7)	Cu(2)···Cu(3)	2.5108(9)
Cu(1)–C(4)	2.123(3)	Cu(1)–C(4)	2.274(6)
Cu(2)–C(4)	2.228(3)	Cu(2)–C(4)	2.121(6)
Cu(3)–C(4)	2.150(4)	Cu(3)–C(4)	2.117(6)
Cu(1)–C(6)	2.037(4)	Cu(1)–C(6)	2.100(6)
Cu(2)–C(6)	2.264(4)	Cu(2)–C(6)	2.153(6)
Cu(3)–C(6)	2.433(4)	Cu(3)–C(6)	2.189(6)
Cu(1)–P(1)	2.2816(10)	Cu(1)–P(1)	2.2558(15)
Cu(1)–P(6)	2.2870(10)	Cu(1)–P(6)	2.2798(15)
Cu(2)–P(2)	2.2997(11)	Cu(2)–P(2)	2.2488(16)
Cu(2)–P(3)	2.2748(11)	Cu(2)–P(3)	2.2786(14)
Cu(3)–P(4)	2.2630(11)	Cu(3)–P(4)	2.2728(15)
Cu(3)–P(5)	2.2918(10)	Cu(3)–P(5)	2.2498(14)
C(4)–C(5)	1.198(4)	C(4)–C(5)	1.208(8)
C(6)–C(7)	1.195(5)	C(6)–C(7)	1.219(8)
O(1)–C(8)	1.212(5)	O(1)–C(8)	1.210(6)
O(4)–C(9)	1.200(5)	O(2)–C(9)	1.237(7)
O(2)–N(5)	1.221(5)	C(5)–C(4)–Cu(1)	121.1(4)
O(3)–N(5)	1.228(4)	C(5)–C(4)–Cu(2)	143.6(5)
O(5)–N(6)	1.259(6)	C(5)–C(4)–Cu(3)	141.6(5)
O(6)–N(6)	1.230(6)	C(7)–C(6)–Cu(1)	136.6(4)
C(7)–C(6)–Cu(1)	158.9(3)	C(7)–C(6)–Cu(2)	140.1(4)
C(7)–C(6)–Cu(2)	127.7(3)	C(7)–C(6)–Cu(3)	130.7(4)
C(7)–C(6)–Cu(3)	116.7(3)	Cu(1)–C(4)–Cu(2)	72.85(19)
C(5)–C(4)–Cu(1)	152.6(3)	Cu(1)–C(4)–Cu(3)	73.04(19)
C(5)–C(4)–Cu(2)	125.9(3)	Cu(2)–C(4)–Cu(3)	72.65(19)
C(5)–C(4)–Cu(3)	125.8(3)	Cu(2)–C(6)–Cu(1)	75.8(2)
Cu(1)–C(4)–Cu(2)	72.30(10)	Cu(3)–C(6)–Cu(1)	75.1(2)
Cu(1)–C(4)–Cu(3)	74.52(11)	Cu(2)–C(6)–Cu(3)	70.64(19)
Cu(3)–C(4)–Cu(2)	77.97(11)		
Cu(1)–C(6)–Cu(2)	73.10(12)		
Cu(1)–C(6)–Cu(3)	70.10(11)		
Cu(2)–C(6)–Cu(3)	71.73(10)		

Table S3. Selected bond lengths (Å) and angles (°) for **3·BF$_4$** and **4·F**

3·BF$_4$		**4·F**	
Cu(1)···Cu(2)	2.5825(9)	Cu(1)···Cu(2)	2.6028(10)
Cu(1)···Cu(3)	2.5658(10)	Cu(1)···Cu(3)	2.6618(9)
Cu(2)···Cu(3)	2.6619(8)	Cu(2)···Cu(3)	2.5769(8)
Cu(1)–C(4)	2.159(2)	Cu(1)–C(4)	2.320(4)
Cu(2)–C(4)	2.179(2)	Cu(2)–C(4)	2.078(4)
Cu(3)–C(4)	2.176(2)	Cu(3)–C(4)	2.148(4)
Cu(1)–C(6)	2.065(2)	Cu(1)–C(6)	2.067(4)
Cu(2)–C(6)	2.231(2)	Cu(2)–C(6)	2.282(4)
Cu(3)–C(6)	2.269(3)	Cu(3)–C(6)	2.210(3)
Cu(1)–P(1)	2.2699(9)	Cu(1)–P(1)	2.2959(13)
Cu(1)–P(6)	2.2830(10)	Cu(1)–P(6)	2.2770(12)
Cu(2)–P(2)	2.3006(9)	Cu(2)–P(2)	2.2749(12)
Cu(2)–P(3)	2.2842(10)	Cu(2)–P(3)	2.2704(11)
Cu(3)–P(4)	2.2649(10)	Cu(3)–P(4)	2.2804(11)
Cu(3)–P(5)	2.2851(10)	Cu(3)–P(5)	2.2637(11)
C(4)–C(5)	1.212(3)	C(4)–C(5)	1.200(5)
C(6)–C(7)	1.202(3)	C(6)–C(7)	1.201(5)
C(8)–O(1)	1.224(3)	C(8)–O(1)	1.193(5)
C(9)–O(2)	1.205(3)	C(9)–O(2)	1.192(6)
C(5)–C(4)–Cu(1)	137.06(19)	C(5)–C(4)–Cu(1)	126.1(3)
C(5)–C(4)–Cu(2)	140.4(2)	C(5)–C(4)–Cu(2)	145.6(3)
C(5)–C(4)–Cu(3)	130.60(19)	C(5)–C(4)–Cu(3)	134.8(3)
C(7)–C(6)–Cu(1)	156.2(2)	C(7)–C(6)–Cu(1)	152.3(3)
C(7)–C(6)–Cu(2)	126.6(2)	C(7)–C(6)–Cu(2)	127.8(3)
C(7)–C(6)–Cu(3)	122.22(19)	C(7)–C(6)–Cu(3)	124.4(4)
Cu(1)–C(4)–Cu(3)	72.58(8)	Cu(2)–C(4)–Cu(1)	72.33(11)
Cu(1)–C(4)–Cu(2)	73.07(8)	Cu(3)–C(4)–Cu(1)	73.01(11)
Cu(3)–C(4)–Cu(2)	75.36(8)	Cu(2)–C(4)–Cu(3)	75.12(12)
Cu(1)–C(6)–Cu(2)	73.79(8)	Cu(1)–C(6)–Cu(2)	73.34(11)
Cu(1)–C(6)–Cu(3)	72.43(8)	Cu(1)–C(6)–Cu(3)	76.90(12)
Cu(2)–C(6)–Cu(3)	72.52(8)	Cu(3)–C(6)–Cu(2)	70.00(10)

Table S4. Selected bond lengths (Å) and angles (°) for **5·F** and **5·BF_4**

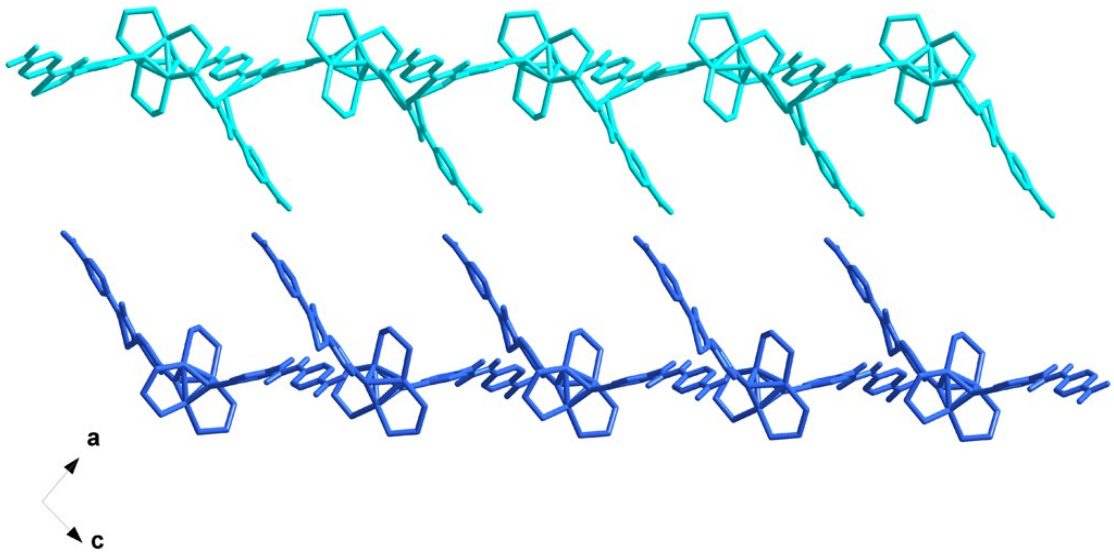
5·F		**5·BF_4**	
Cu(1)···Cu(2)	2.6655(8)	Cu(1)···Cu(2)	2.5807(9)
Cu(1)···Cu(1)#1	2.5509(9)	Cu(1)···Cu(3)	2.6265(9)
Cu(2)···Cu(1)#1	2.6654(8)	Cu(2)···Cu(3)	2.5881(8)
Cu(1)–C(3)	2.110(4)	Cu(1)–C(4)	2.157(4)
Cu(2)–C(3)	2.370(5)	Cu(2)–C(4)	2.321(4)
Cu(1)#1–C(3)	2.110(4)	Cu(3)–C(4)	2.068(4)
Cu(1)–C(6)	2.199(4)	Cu(1)–C(6)	2.147(4)
Cu(2)–C(6)	2.089(5)	Cu(2)–C(6)	2.065(4)
Cu(1)#1–C(6)	2.199(4)	Cu(3)–C(6)	2.382(5)
Cu(1)–P(1)	2.2740(10)	Cu(1)–P(1)	2.2718(12)
Cu(1)–P(3)	2.2757(11)	Cu(1)–P(6)	2.2654(11)
Cu(2)–P(2)	2.2672(11)	Cu(2)–P(2)	2.2741(12)
Cu(2)–P(2)#1	2.2672(10)	Cu(2)–P(3)	2.2620(12)
C(3)–C(4)	1.210(7)	Cu(3)–P(4)	2.2979(12)
C(6)–C(7)	1.168(7)	Cu(3)–P(5)	2.2662(11)
C(5)–O(1)	1.211(8)	C(4)–C(5)	1.209(5)
C(8)–O(2)	1.205(13)	C(7)–C(6)	1.213(5)
C(4)–C(3)–Cu(1)	142.69(9)	C(8)–O(1)	1.222(5)
C(4)–C(3)–Cu(2)	108.8(4)	C(9)–O(2)	1.215(5)
C(4)–C(3)–Cu(1)#1	142.69(9)	C(5)–C(4)–Cu(1)	134.5(3)
C(7)–C(6)–Cu(1)	133.1(3)	C(5)–C(4)–Cu(2)	133.0(3)
C(7)–C(6)–Cu(2)	139.2(5)	C(5)–C(4)–Cu(3)	141.2(3)
C(7)–C(6)–Cu(1)#1	133.1(3)	C(7)–C(6)–Cu(1)	132.3(3)
Cu(1)–C(3)–Cu(1)#1	74.40(16)	C(7)–C(6)–Cu(2)	139.5(3)
Cu(1)–C(3)–Cu(2)	72.76(15)	C(7)–C(6)–Cu(3)	139.2(3)
Cu(1)#1–C(3)–Cu(2)	72.76(15)	Cu(2)–C(4)–Cu(1)	70.27(12)
Cu(1)–C(6)–Cu(2)	76.84(16)	Cu(3)–C(4)–Cu(1)	76.84(13)
Cu(1)–C(6)–Cu(1)#1	70.92(16)	Cu(2)–C(4)–Cu(3)	72.01(12)
Cu(2)–C(6)–Cu(1)#1	76.84(16)	Cu(1)–C(6)–Cu(2)	75.55(13)
		Cu(1)–C(6)–Cu(3)	70.68(13)
		Cu(3)–C(6)–Cu(2)	70.77(13)

Symmetry Code: #1: x,–y+1/2,z

Table S5. Selected bond lengths (Å) and angles (°) for **5·NO$_3$** and **6·0.5F·0.5BF$_4$**

5·NO$_3$		**6·0.5F·0.5BF$_4$**	
Cu(1)···Cu(2)	2.6038(5)	Cu(1)···Cu(2)	2.5574(7)
Cu(1)···Cu(3)	2.5861(5)	Cu(1)···Cu(3)	2.6727(7)
Cu(2)···Cu(3)	2.6171(5)	Cu(2)···Cu(3)	2.6566(6)
Cu(1)–C(4)	2.255(3)	Cu(1)–C(4)	2.149(5)
Cu(2)–C(4)	2.104(3)	Cu(2)–C(4)	2.088(4)
Cu(3)–C(4)	2.140(3)	Cu(3)–C(4)	2.381(4)
Cu(1)–C(6)	2.086(3)	Cu(1)–C(6)	2.272(4)
Cu(2)–C(6)	2.350(3)	Cu(2)–C(6)	2.213(4)
Cu(3)–C(6)	2.199(3)	Cu(3)–C(6)	2.092(4)
Cu(1)–P(1)	2.2654(8)	Cu(1)–P(1)	2.2846(11)
Cu(1)–P(6)	2.2845(8)	Cu(1)–P(6)	2.2686(11)
Cu(2)–P(2)	2.3084(7)	Cu(2)–P(2)	2.2940(11)
Cu(2)–P(3)	2.2810(7)	Cu(2)–P(3)	2.2745(13)
Cu(3)–P(4)	2.2665(7)	Cu(3)–P(4)	2.2885(12)
Cu(3)–P(5)	2.2890(8)	Cu(3)–P(5)	2.2989(10)
C(4)–C(5)	1.218(4)	C(4)–C(5)	1.215(6)
C(7)–C(6)	1.217(4)	C(6)–C(7)	1.202(6)
C(8)–O(1)	1.207(4)	C(8)–O(1)	1.222(6)
C(9)–O(2)	1.216(4)	C(9)–O(3)	1.224(5)
C(5)–C(4)–Cu(1)	125.6(2)	C(5)–C(4)–Cu(1)	134.2(4)
C(5)–C(4)–Cu(2)	143.9(2)	C(5)–C(4)–Cu(2)	151.0(4)
C(5)–C(4)–Cu(3)	136.0(2)	C(5)–C(4)–Cu(3)	116.6(3)
C(7)–C(6)–Cu(1)	145.3(2)	C(7)–C(6)–Cu(1)	127.0(4)
C(7)–C(6)–Cu(2)	139.3(2)	C(7)–C(6)–Cu(2)	132.6(3)
C(7)–C(6)–Cu(3)	124.5(2)	C(7)–C(6)–Cu(3)	145.9(3)
Cu(2)–C(4)–Cu(1)	73.26(8)	Cu(2)–C(4)–Cu(1)	74.24(15)
Cu(3)–C(4)–Cu(1)	72.05(8)	Cu(1)–C(4)–Cu(3)	72.11(13)
Cu(2)–C(4)–Cu(3)	76.14(9)	Cu(2)–C(4)–Cu(3)	72.60(13)
Cu(1)–C(6)–Cu(2)	72.05(8)	Cu(2)–C(6)–Cu(1)	69.52(11)
Cu(1)–C(6)–Cu(3)	74.17(9)	Cu(3)–C(6)–Cu(1)	75.41(13)
Cu(3)–C(6)–Cu(2)	70.15(8)	Cu(3)–C(6)–Cu(2)	76.17(14)

(a)



(b)

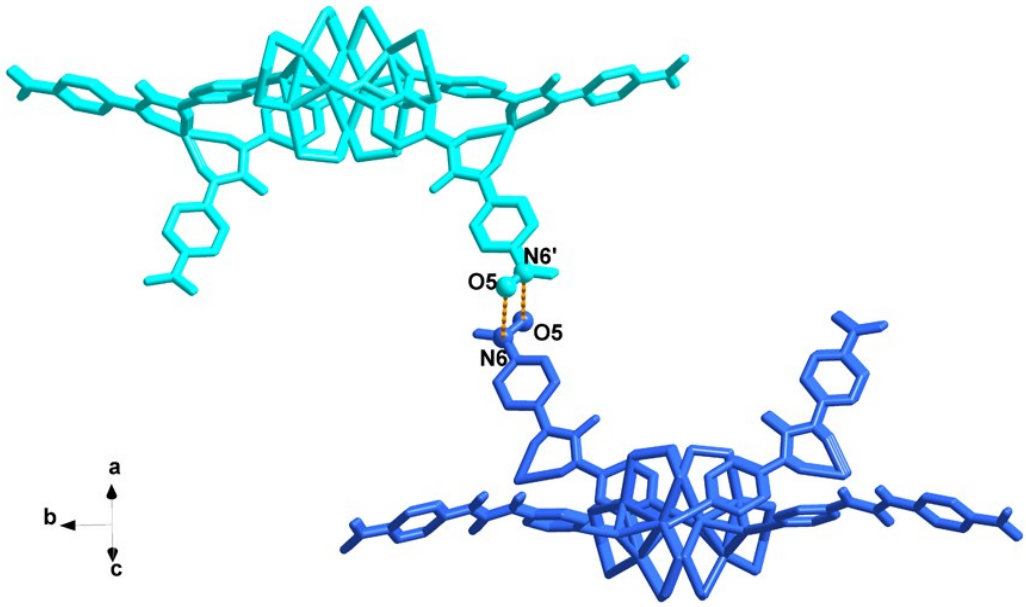


Figure S10. Two independent *meso*-helical chains linked by $NO_2\cdots NO_2$ interactions in the anion coordination polymer (ACP) **1·F**. View along the *b*-axis (a).Intermolecular $NO_2\cdots NO_2$ interactions in **1·F** (b).

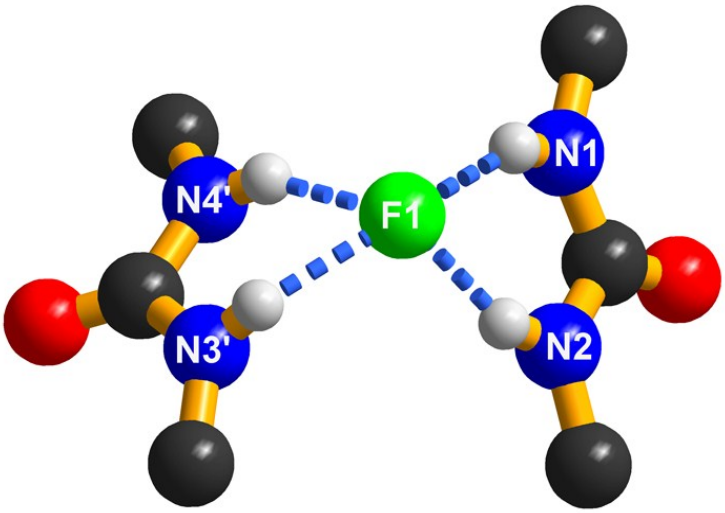


Figure S11. Anion coordination environment in anion coordination polymer (ACP) **4·F** (green: F; red: O; black: C; blue: N; white: H). Only urea groups and anions are shown for clarity.

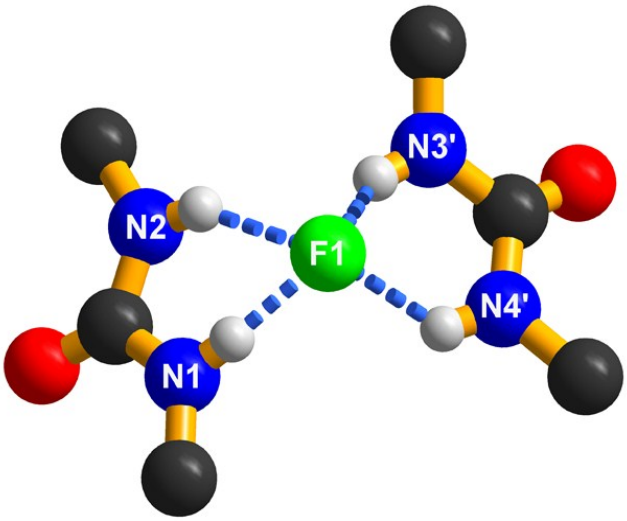
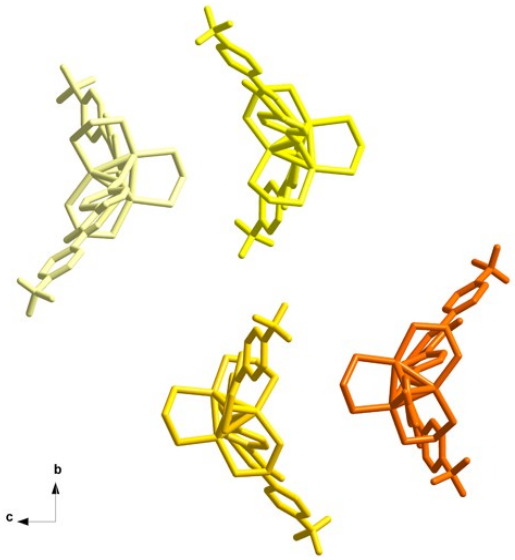


Figure S12. Anion coordination environment in anion coordination polymer (ACP) **5·F** (green: F; red: O; black: C; bule: N; white: H). Only urea groups and anions are shown for clarity.

Table S6. Selected hydrogen bonding parameters for **3·BF$_4$**, **4·F**, **5·F**, and **6·0.5F·0.5BF$_4$**

Compound	D–H···A	D–H (Å)	H···A (Å)	D···A (Å)	∠ DHA(°)	Symmetry Code
3·BF$_4$	N(1)-H(1A)···F(1)	0.88	1.97	2.845(3)	171.3	
	N(2)-H(2A)···F(2)	0.88	2.40	3.236(4)	158.1	
	N(2)-H(2A)···F(1)	0.88	2.50	3.273(4)	147.4	
	N(3)-H(3A)···F(2)#1	0.88	2.11	2.964(3)	165.0	x – 1, y–1, z
	N(4)-H(4A)···F(3)#1	0.88	2.05	2.916(3)	166.3	x – 1, y–1, z
4·F	N(1)-H(1A)···F(1)#1	0.88	1.96	2.784(5)	154.5	x, y– 1, z
	N(2)-H(2A)···F(1)#1	0.88	1.93	2.760(5)	157.0	x, y– 1, z
	N(3)-H(3A)···F(1)	0.88	2.00	2.720(5)	138.4	
	N(4)-H(4A)···F(1)	0.88	1.95	2.757(6)	151.8	
5·F	N(1)-H(1)···F(1)	0.88	1.74	2.613(7)	174.1	
	N(2)-H(2)···F(1)	0.88	2.27	3.051(9)	147.7	
	N(3)-H(3)···F(1)#2	0.88	1.74	2.527(9)	147.3	2x– 1, y, z–1
	N(4)-H(4)···F(1)#2	0.88	2.13	2.794(9)	132.2	2x– 1, y, z– 1
6·0.5F·0.5BF$_4$	N(1)-H(1A)···F(2B)	0.88	2.29	3.099(16)	153.5	
	N(1)-H(1A)···F(2A)	0.88	2.44	3.188(15)	143.2	
	N(2)-H(2A)···F(2A)	0.88	1.88	2.757(13)	173.5	
	N(3)-H(3A)···F(1)	0.88	2.25	2.990(3)	142.0	

(a)



(b)

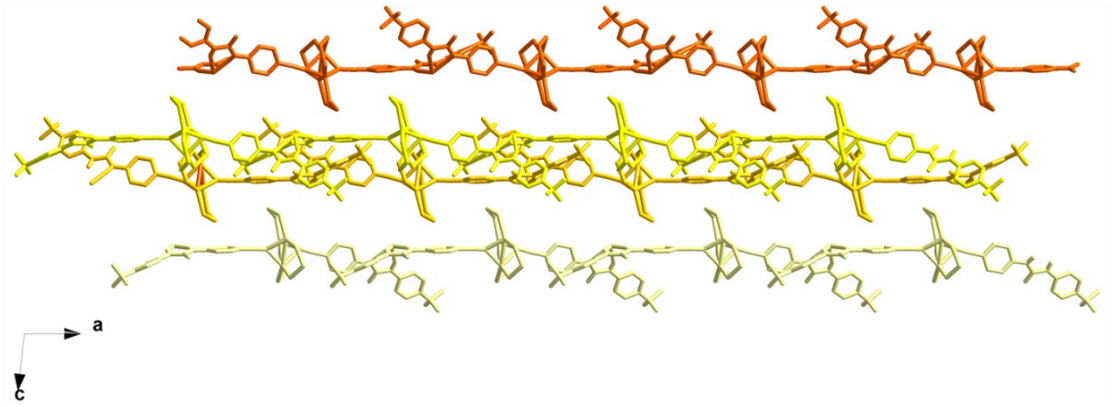
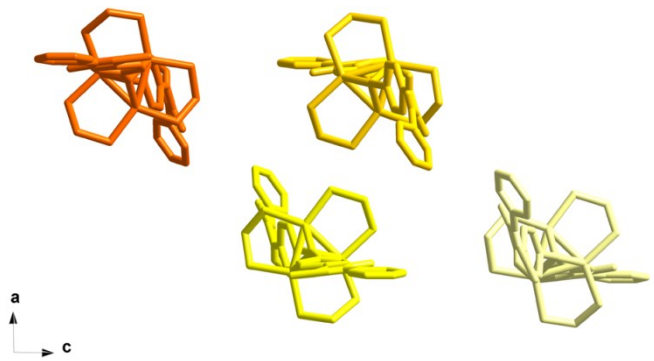


Figure S13. Four independent 1-D linear chains found in anion coordination polymer (ACP) **2·F** (view from the top of 1-D chains (a); view alone the 1-D chains (b)).

(a)



(b)

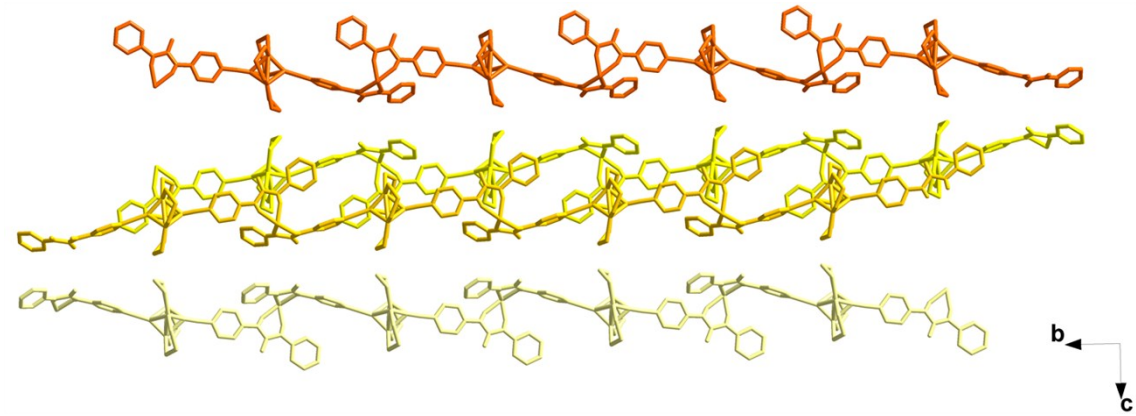
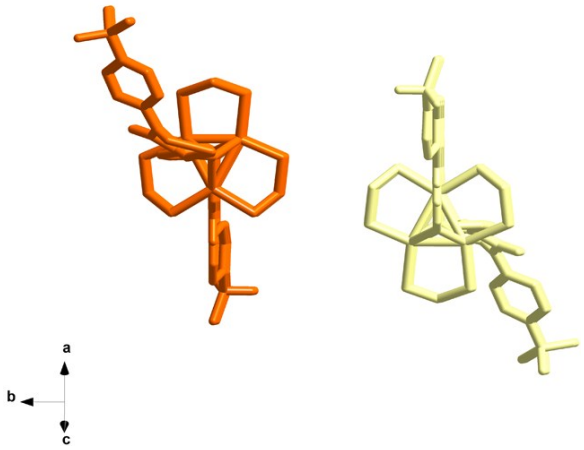


Figure S14. Four independent 1-D linear chains in anion coordination polymer (ACP) **4·F** (view from the top of 1-D chains (a); view alone the 1-D chains (b)).

(a)



(b)

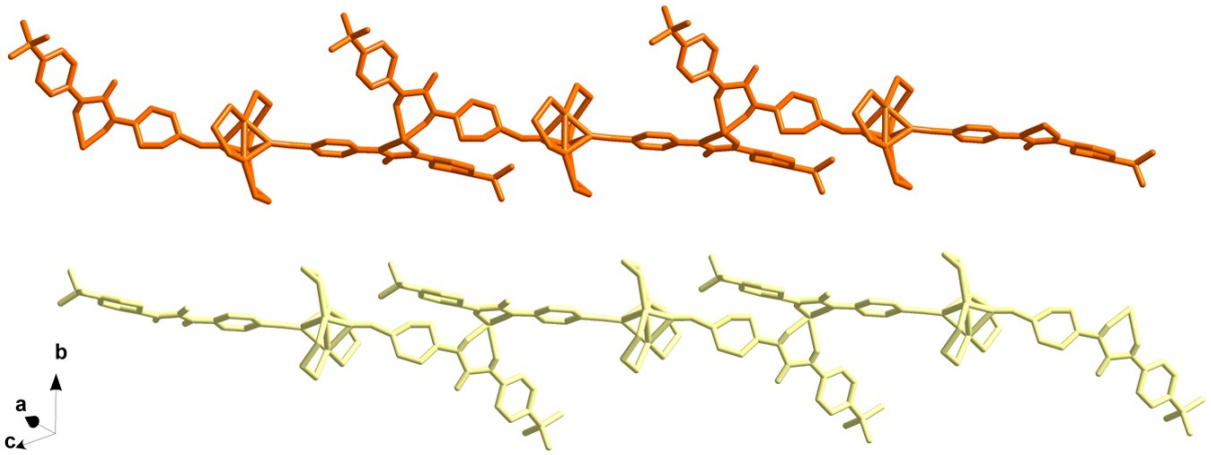
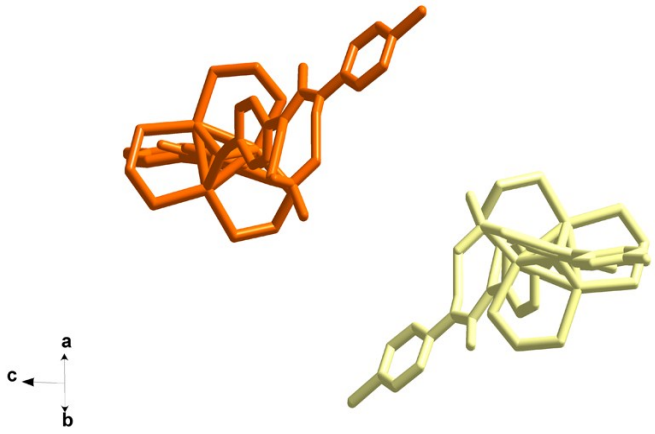


Figure S15. Two independent 1-D linear chains in anion coordination polymer (ACP) **5·F** (view from the top of 1-D chains (a); view along the 1-D chains (b)).

(a)



(b)

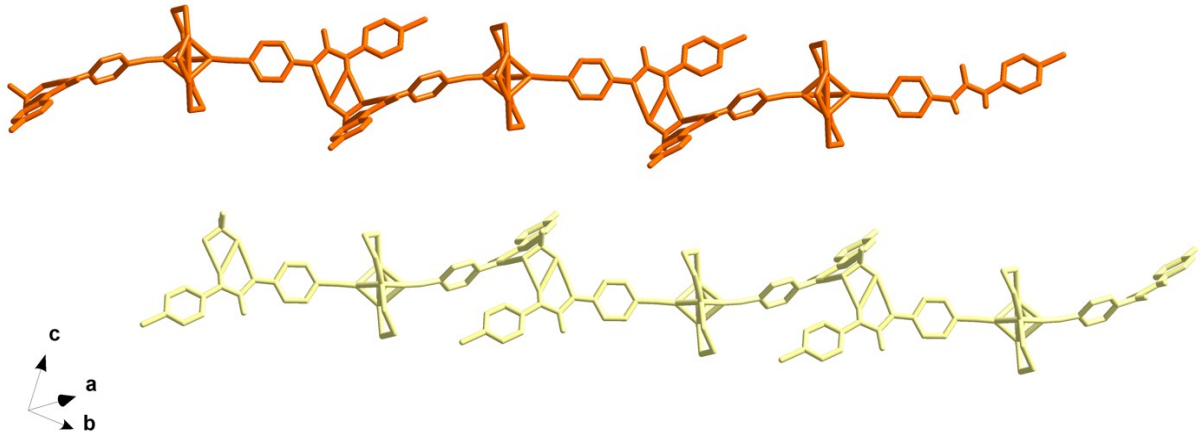
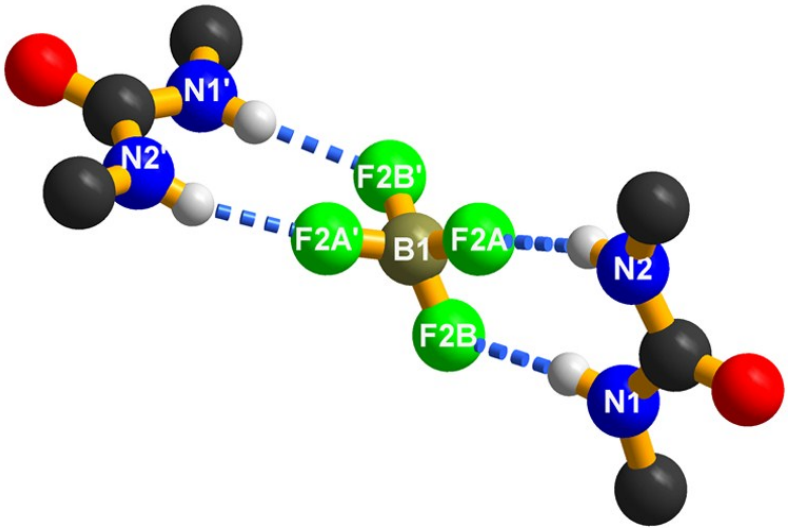


Figure S16. Two independent 1-D linear chains in anion coordination polymer (ACP) **3**·$\mathbf{BF_4}$ (view from the top of 1-D chains (a); view along the 1-D chains (b)).

(a)



(b)

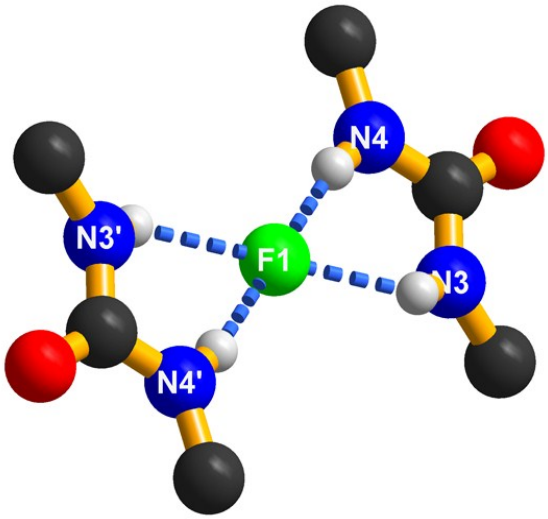


Figure S17. Anion coordination environment (BF_4^- (a) and F^- (b)) in anion coordination polymer (ACP) **6·0.5F·0.5BF$_4$** (green: F; red: O; black: C; bule: N; white: H; brown: B). Only urea groups and anions are shown for clarity.

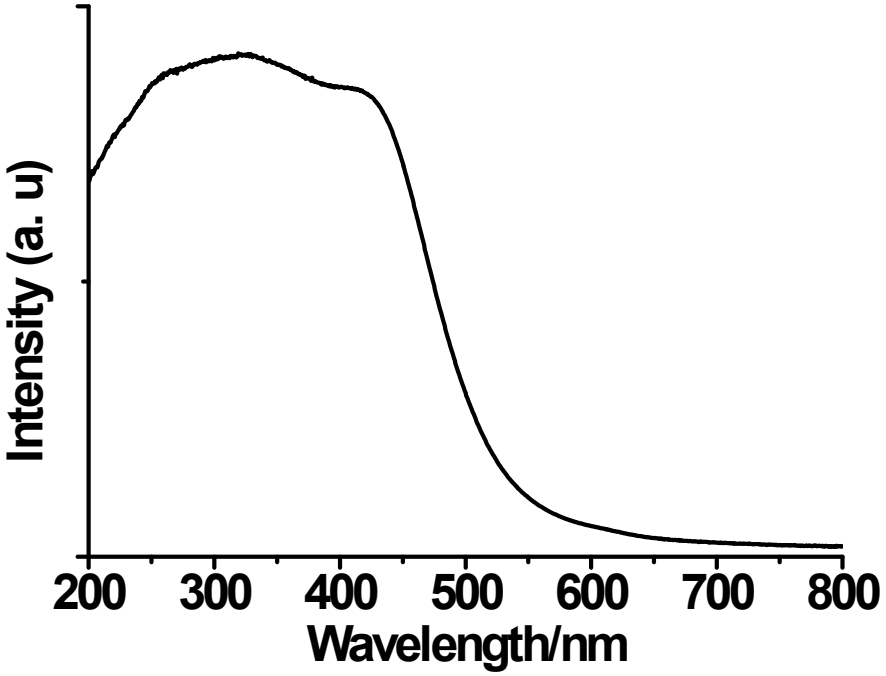


Figure S18. UV-vis electronic absorption spectrum of **1·F** in the solid state at room temperature.

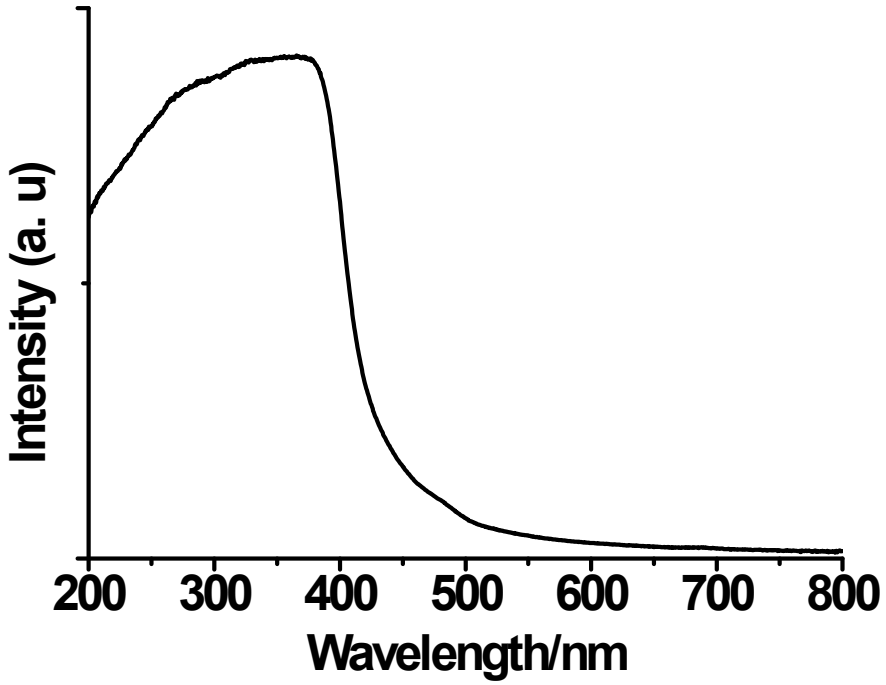


Figure S19. UV-vis electronic absorption spectrum of **2·F** in the solid state at room temperature.

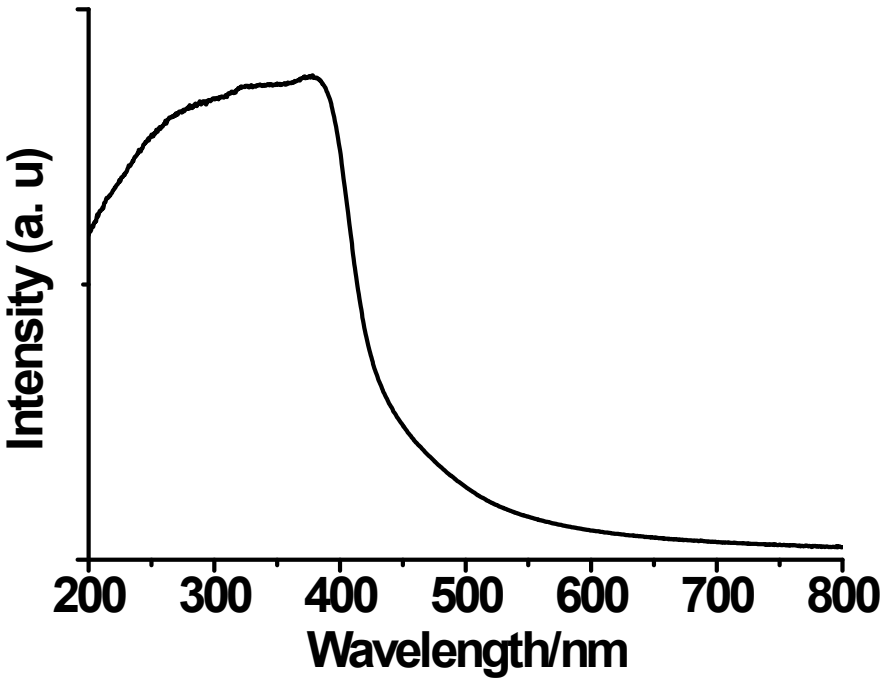


Figure S20. UV-vis electronic absorption spectrum of **3**·BF_4 in the solid state at room temperature.

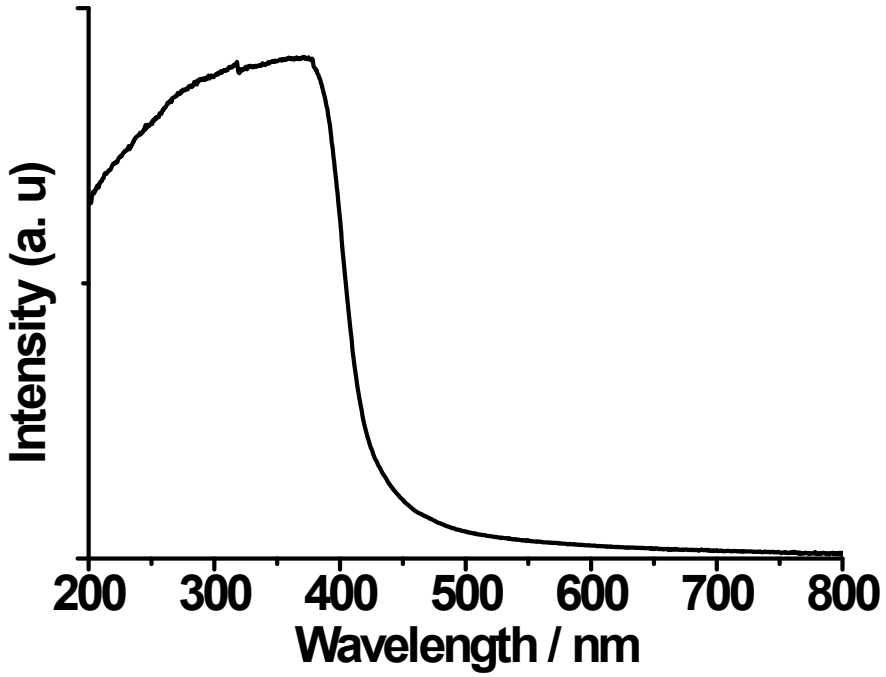


Figure S21. UV-vis electronic absorption spectrum of **4**·**F** in the solid state at room temperature.

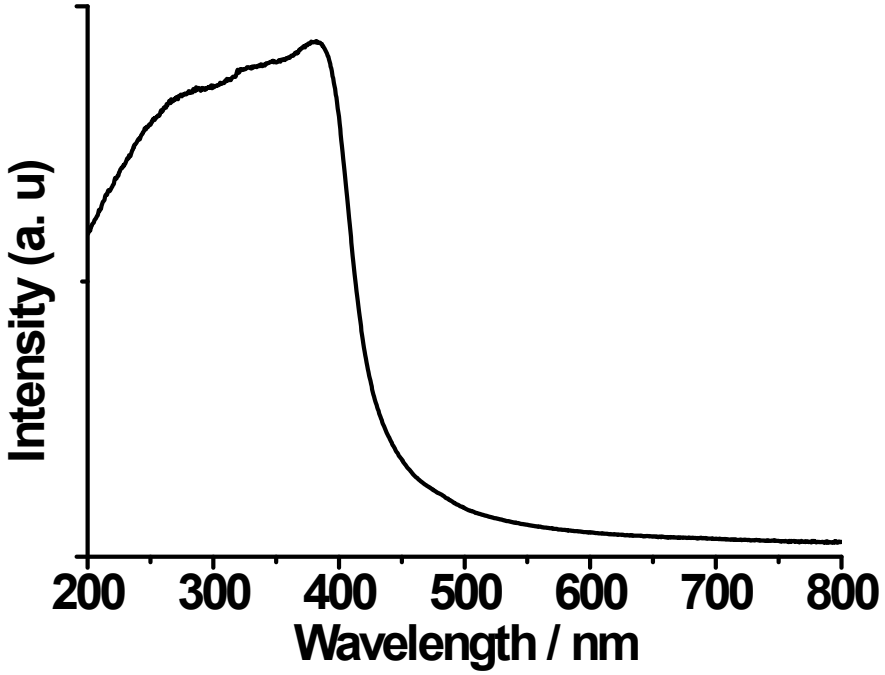


Figure S22. UV-vis electronic absorption spectrum of **5·F** in the solid state at room temperature.

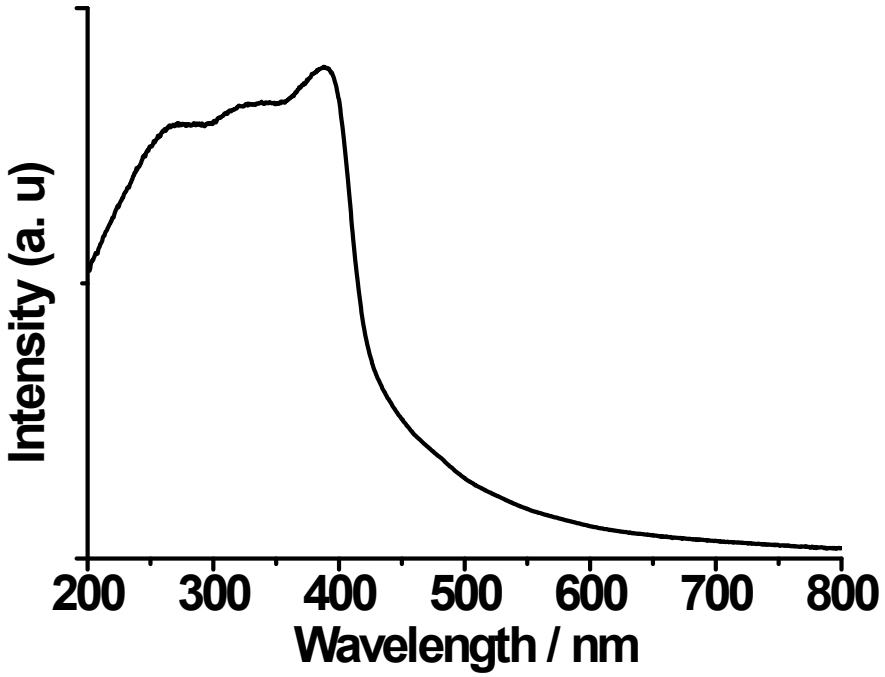


Figure S23. UV-vis electronic absorption spectrum of **5·BF_4** in the solid state at room temperature.

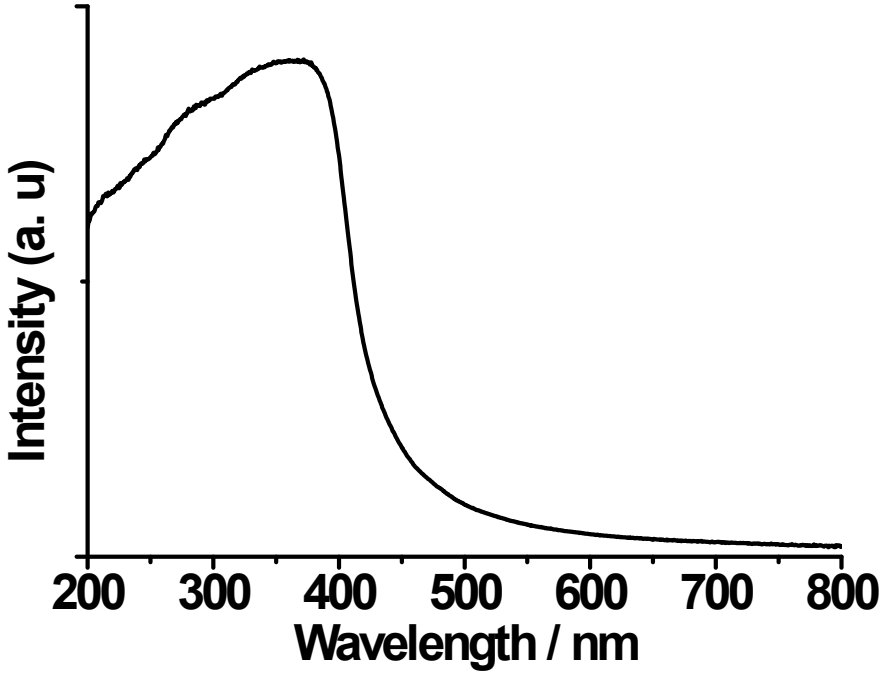


Figure S24. UV-vis electronic absorption spectrum of **5·NO_3** in the solid state at room temperature.

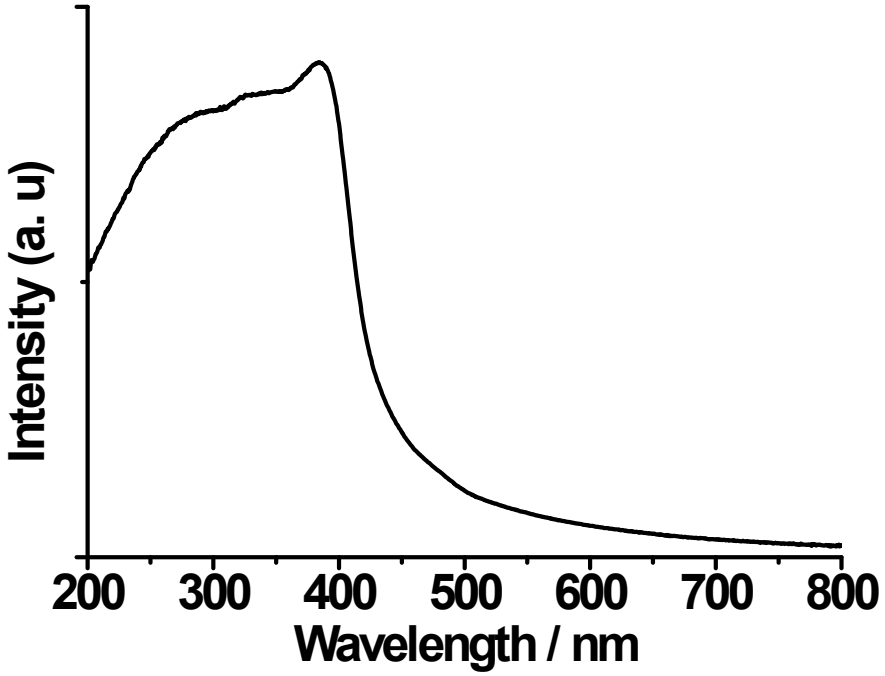
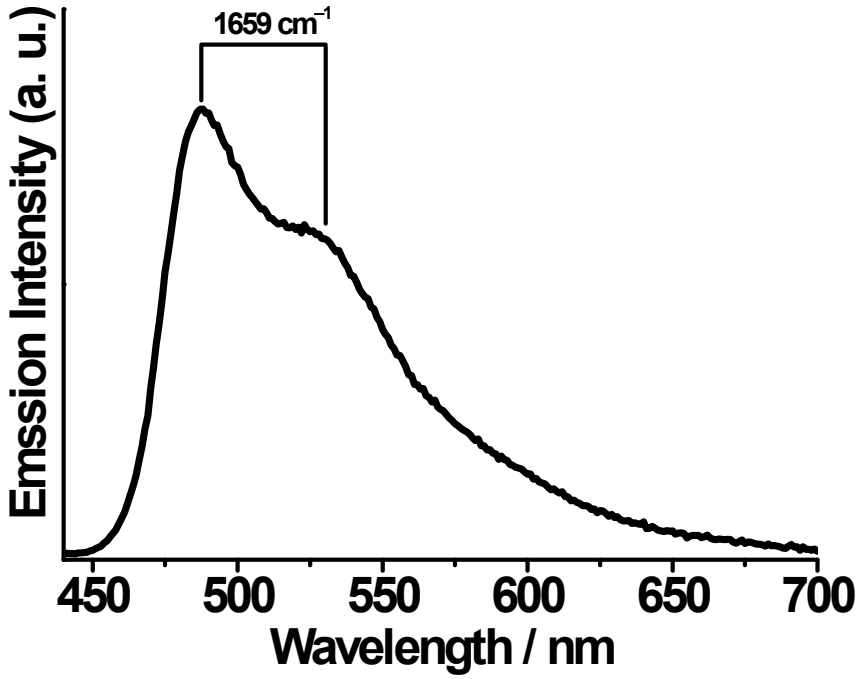


Figure S25. UV-vis electronic absorption spectrum of **6·0.5F·0.5BF_4** in the solid state at room temperature.

(a)



(b)

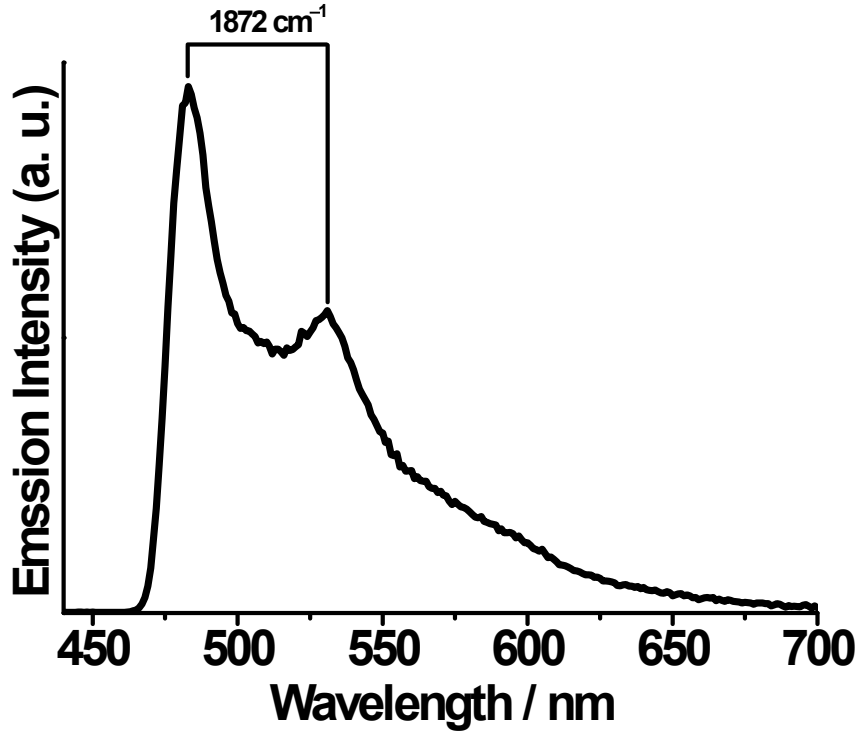
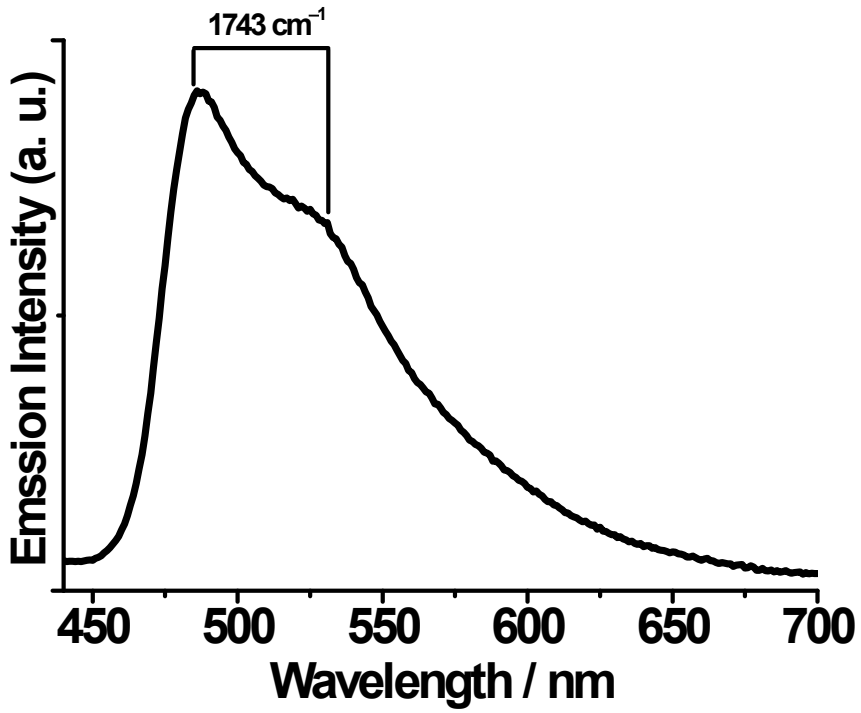


Figure S26. Emission spectra of **2·F** in the solid state at 298 K (a) and 77 K (b) (λ_{ex} = 300 nm).

(a)



(b)

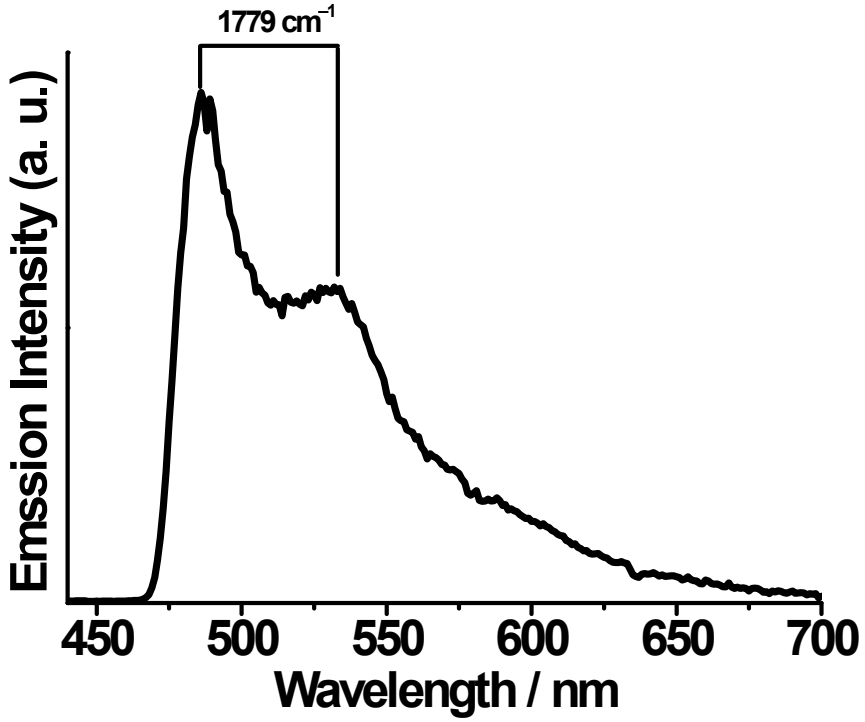
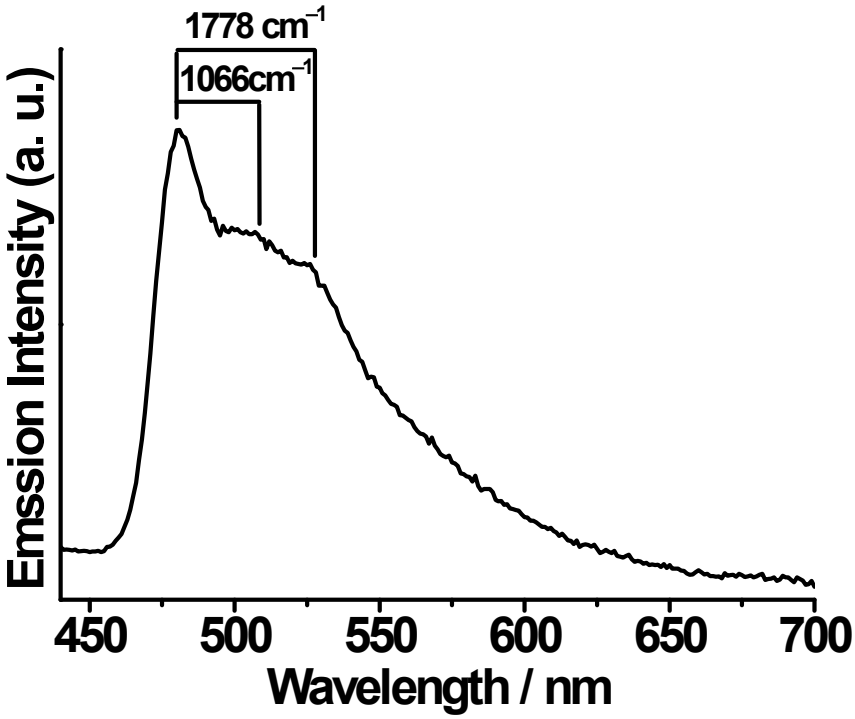


Figure S27. Emission spectra of **3·BF$_4$** in the solid state at 298 K (a) and 77 K (b) (λ_{ex} = 300 nm).

(a)



(b)

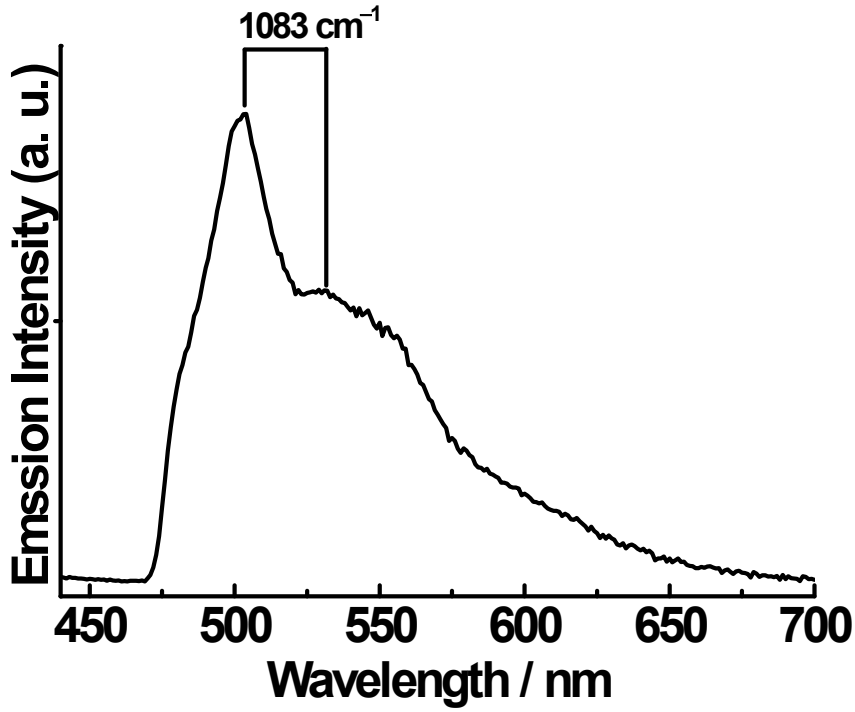
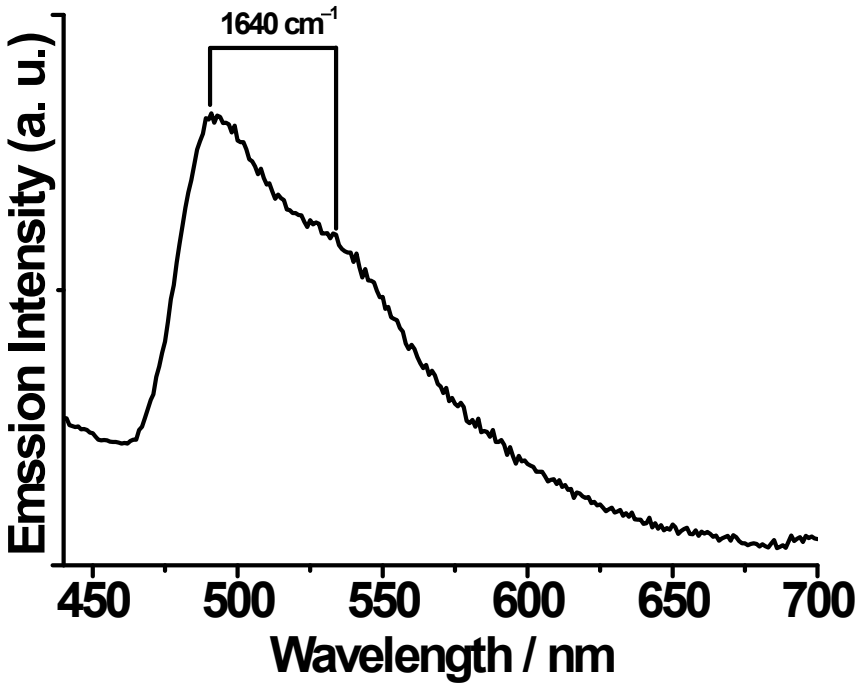


Figure S28. Emission spectra of **4·F** in the solid state at 298 K (a) and 77 K (b) (λ_{ex} = 300 nm).

(a)



(b)

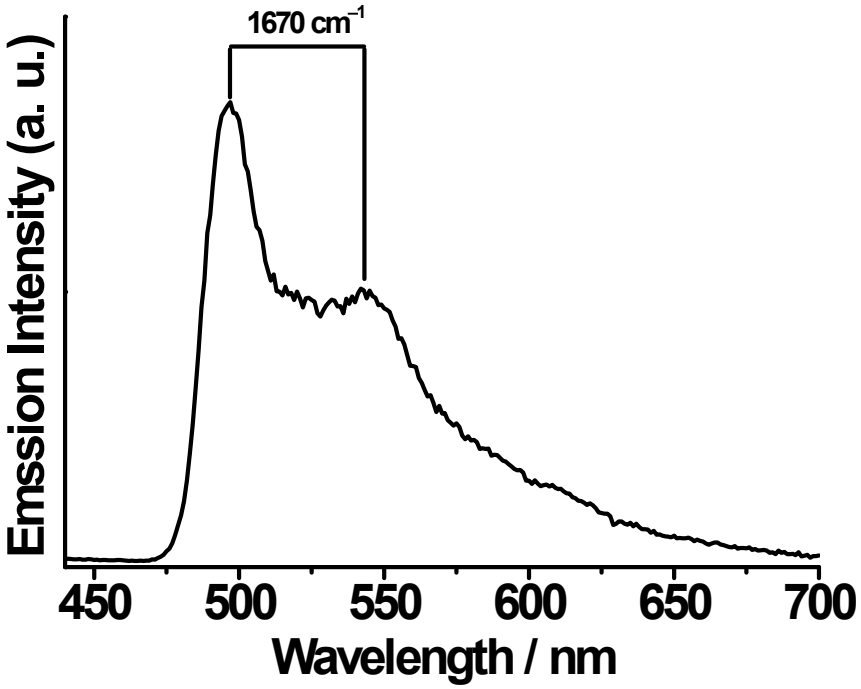
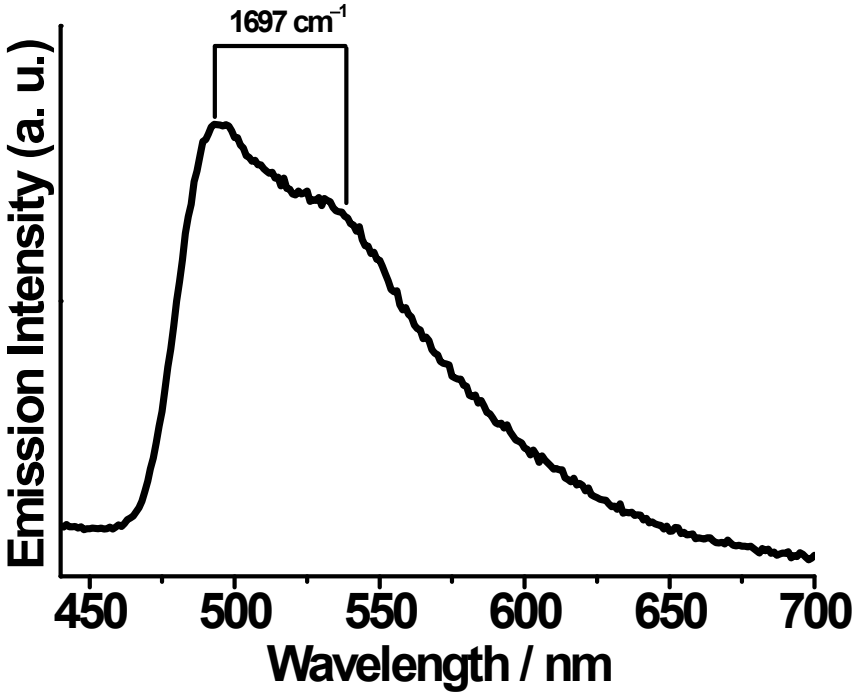


Figure S29. Emission spectra of **5·F** in the solid state at 298 K (a) and 77 K (b) (λ_{ex} = 300 nm).

(a)



(b)

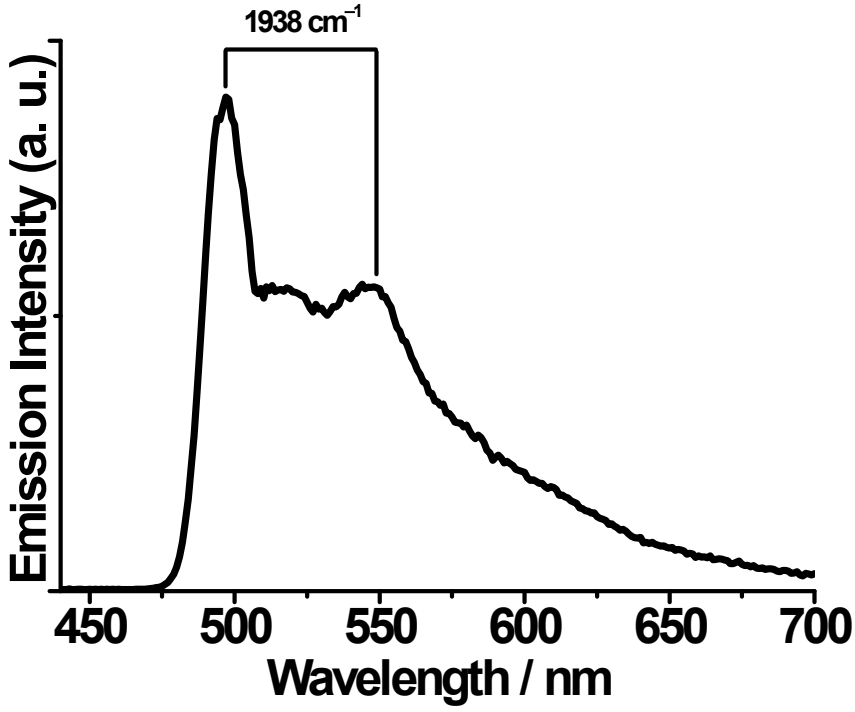
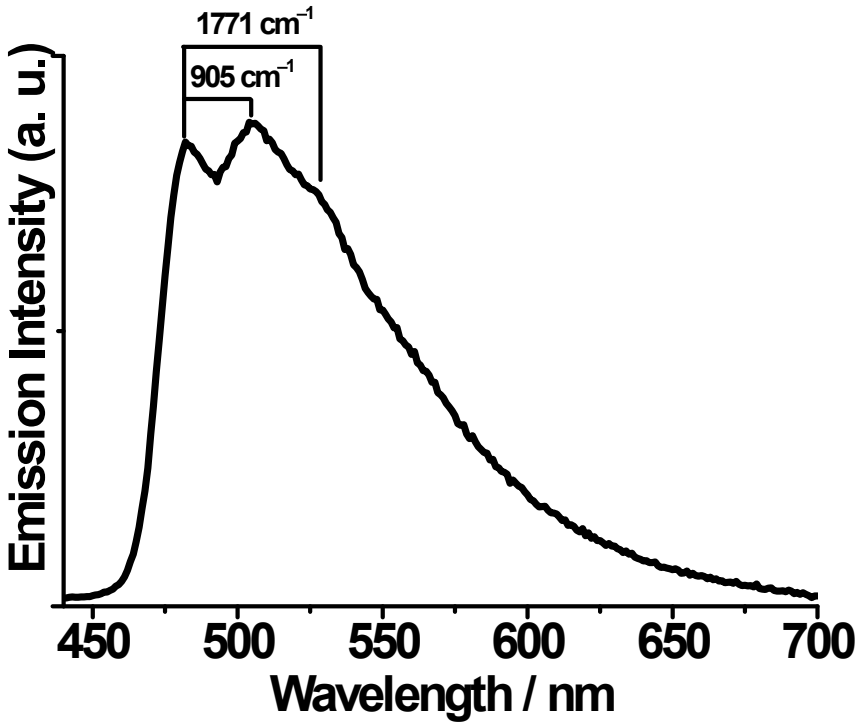


Figure S30. Emission spectra of **5·BF$_4$** in the solid state at 298 K (a) and 77 K (b) (λ_{ex} = 300 nm).

(a)



(b)

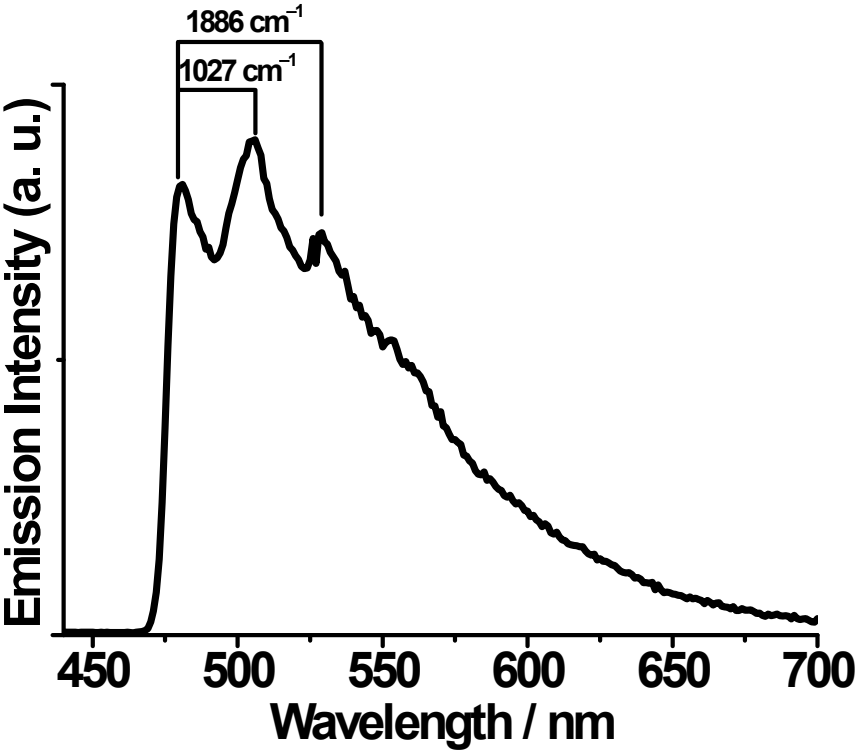
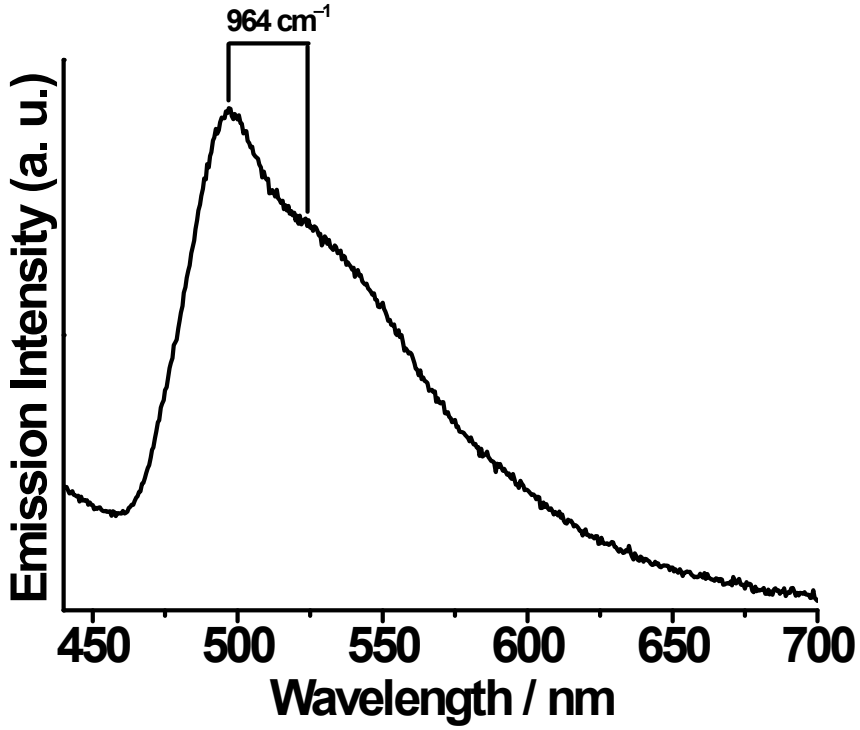


Figure S31. Emission spectra of **5**·NO_3 in the solid state at 298 K (a) and 77 K (b) (λ_{ex} = 300 nm).

(a)



(b)

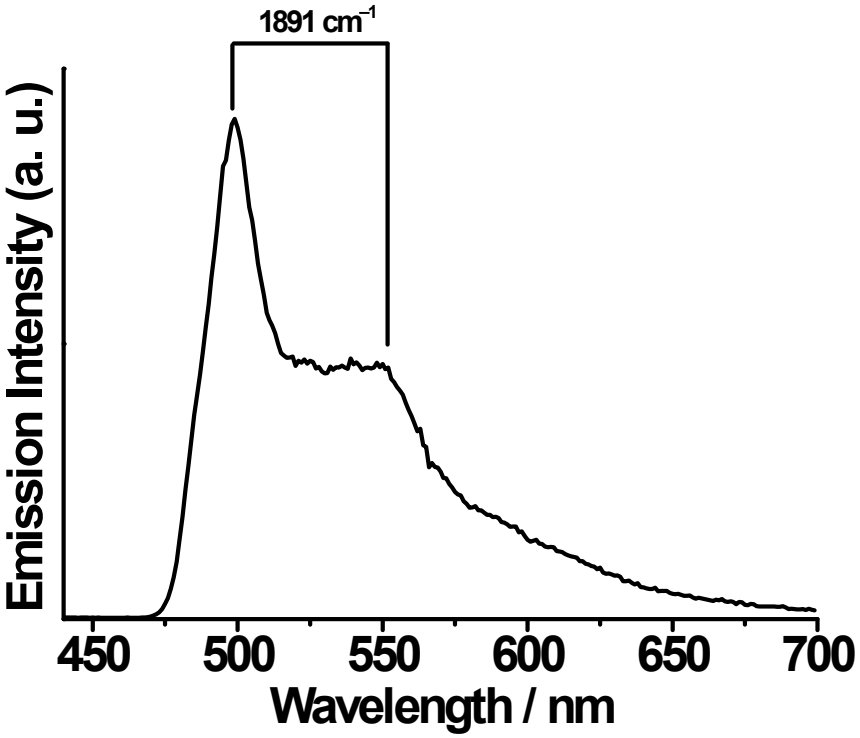


Figure S32. Emission spectra of **6·0.5F·0.5BF$_4$** in the solid state at 298 K (a) and 77 K (b) (λ_{ex} = 300 nm).